



environmental consultants, inc.

DE/AFS/SF

www.jbrenv.com

7669 West Riverside Dr., Suite 101 • Boise, Idaho 83714 [P] 208.853.0883 [F] 208.853.0884

February 12, 2007

RECEIVED

Air Quality Program Office- Application Processing
Department of Environmental Quality
1410 N. Hilton
Boise, ID 83706-1255

FEB 12 2007

Department of Environmental Quality
State Air Program

RE: RDO Processing, LLC- PTC Application for Revision to Fuel Oil Nickel Content

To Whom It May Concern:

JBR Environmental Consultants, Inc. is submitting on behalf of RDO Processing, LLC a PTC application for revision to fuel oil nickel content. On December 15, 2006 a draft permit to construct and Tier II operating permit number T2-060510 was issued for review. RDO would like to modify draft permit condition 3.15.1 as described in this application. Based on conversations with Cheryl Robinson of DEQ it was determined a PTC application is necessary. DEQ stated that only revised sections need to be submitted.

Please feel free to contact myself at 208.853.0883 if you have any questions or need additional information.

Sincerely,

Daniel Heiser, P.E.

Daniel Heiser, P.E.
JBR Environmental Consultants, Inc.

Handdelivered
RECEIVED
RDO PTC
FEB 12 2007
Department of Environmental Quality
State Air Program

cc: Jan Nel- RDO Processing

Enclosure: PTC Application Fee
PTC Application Forms
PTC Modeling Report
Electronic Modeling Files



DEQ AIR QUALITY PROGRAM
 1410 N. Hilton, Boise, ID 83706
 For assistance, call the
Air Permit Hotline – 877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 1
 01/11/07

Please see instructions on page 2 before filling out the form.

COMPANY NAME, FACILITY NAME, AND FACILITY ID NUMBER			
1. Company Name		RDO Processing, LLC.	
2. Facility Name		3. Facility ID No. 033-00002	
4. Brief Project Description - Revision to Fuel Oil Nickel Content One sentence or less			
PERMIT APPLICATION TYPE			
5. <input type="checkbox"/> New Facility <input type="checkbox"/> New Source at Existing Facility <input type="checkbox"/> Unpermitted Existing Source <input checked="" type="checkbox"/> Modify Existing Source: Permit No.: <u>Draft Permit T2-060510</u> Date Issued: <u>December 15, 2006</u> <input type="checkbox"/> Required by Enforcement Action: Case No.: _____			
6. <input checked="" type="checkbox"/> Minor PTC <input type="checkbox"/> Major PTC			
FORMS INCLUDED			
Included	N/A	Forms	DEQ Verify
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Form GI – Facility Information	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form EU0 – Emissions Units General	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form EU1 - Industrial Engine Information Please Specify number of forms attached: _____	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form EU2 - Nonmetallic Mineral Processing Plants Please Specify number of forms attached: _____	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form EU3 - Spray Paint Booth Information Please Specify number of forms attached: _____	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form EU4 - Cooling Tower Information Please Specify number of forms attached: _____	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Form EU5 – Boiler Information Please Specify number of forms attached: <u>1</u>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form HMAP – Hot Mix Asphalt Plant Please Specify number of forms attached: _____	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form CBP - Concrete Batch Plant Please Specify number of forms attached: _____	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form BCE - Baghouses Control Equipment	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form SCE - Scrubbers Control Equipment	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Forms EI-CP1 - EI-CP4 - Emissions Inventory- criteria pollutants (Excel workbook, all 4 worksheets)	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	PP – Plot Plan	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Forms MI1 – MI4 – Modeling (Excel workbook, all 4 worksheets)	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form FRA – Federal Regulation Applicability	<input type="checkbox"/>

DEQ USE ONLY
Date Received
<div>RECEIVED</div> <div>FEB 12 2007</div> <div>DEPARTMENT OF ENVIRONMENTAL QUALITY STATE A Q PROGRAM</div>
Project Number
Payment / Fees Included? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Check Number



DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 1
01/11/07

Please see instructions on page **Error! Bookmark not defined.** before filling out the form.

All information is required. If information is missing, the application will not be processed.

IDENTIFICATION

1. Company Name	RDO Processing, LLC.
2. Facility Name (if different than #1)	
3. Facility I.D. No.	033-00002
4. Brief Project Description:	Revision to Fuel Oil Nickel Content

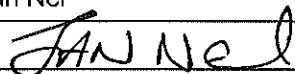
FACILITY INFORMATION

5. Owned/operated by: (✓if applicable)	<input type="checkbox"/> Federal government <input type="checkbox"/> County government <input type="checkbox"/> State government <input type="checkbox"/> City government
6. Primary Facility Permit Contact Person/Title	Jan Nel, Plant Manager
7. Telephone Number and Email Address	208-374-5600 jnel@rdoprocessing.com
8. Alternate Facility Contact Person/Title	
9. Telephone Number and Email Address	
10. Address to which permit should be sent	P.O. Box 265
11. City/State/Zip	Dubois, ID 83423
12. Equipment Location Address (if different than #9)	Section 28, Township 9N, Range 36E
13. City/State/Zip	
14. Is the Equipment Portable?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
15. SIC Code(s) and NAISC Code	Primary SIC: 2034 Secondary SIC (if any): NAICS:
16. Brief Business Description and Principal Product	Potato Dehydration Facility
17. Identify any adjacent or contiguous facility that this company owns and/or operates	

PERMIT APPLICATION TYPE

18. Specify Reason for Application	<input type="checkbox"/> New Facility <input type="checkbox"/> New Source at Existing Facility <input checked="" type="checkbox"/> Modify Existing Source: Permit No.: <u>Draft Permit T2-060510</u> Date Issued: <u>December 15, 2006</u> <input type="checkbox"/> Unpermitted Existing Source: <input type="checkbox"/> Required by Enforcement Action: Case No.:
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CERTIFICATION

IN ACCORDANCE WITH IDAPA 58.01.01.123 (RULES FOR THE CONTROL OF AIR POLLUTION IN IDAHO), I CERTIFY BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE STATEMENTS AND INFORMATION IN THE DOCUMENT ARE TRUE, ACCURATE, AND COMPLETE.	
19. Responsible Official's Name/Title	Jan Nel
20. RESPONSIBLE OFFICIAL SIGNATURE	
21. <input checked="" type="checkbox"/> Check here to indicate you would like to review a draft permit prior to final issuance.	Date: <u>2.7.07.</u>



DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
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Air Permit Hotline – 877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 1
01/11/07

Please see instructions on page **Error! Bookmark not defined.** before filling out the form.

IDENTIFICATION				
Company Name: RDO Processing, LLC.		Facility Name:		Facility ID No: 033-00002
Brief Project Description:		Revision to Fuel Oil Nickel Content		
EXEMPTION				
Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.				
Boiler (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS				
1. Type of Request <input type="checkbox"/> New Unit <input type="checkbox"/> Unpermitted Existing Unit <input checked="" type="checkbox"/> Modification to a unit with Permit #:Draft T2-060510				
2. Use of Boiler: <input checked="" type="checkbox"/> 100% Used For Process <input type="checkbox"/> % Used For Space Heat <input type="checkbox"/> % Used For Generating Electricity				
3. Boiler ID Number: Boiler Number 1		4. Rated Capacity: <input checked="" type="checkbox"/> 150 Million British Thermal Units Per Hour (MMBtu/hr) <input type="checkbox"/> 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)		
5. Construction Date: As soon as permit is issued		6. Manufacturer: Nebraska	7. Model: NS-F-89-ECON	
8. Date of Modification (if applicable): As soon as permit is issued		9. Serial Number (if available): D-3465	10. Control Device (if any): Note: Attach applicable control equipment form(s)	
FUEL DESCRIPTION AND SPECIFICATIONS				
11. Fuel Type	<input checked="" type="checkbox"/> Diesel Fuel (# 2) (gal/hr)	<input type="checkbox"/> Natural Gas (cf/hr)	<input checked="" type="checkbox"/> Propane (unit: gal /hr)	<input checked="" type="checkbox"/> Residual fuel oil (unit:gal /hr)
12. Full Load Consumption Rate	1041		1596	1041
13. Actual Consumption Rate	1041		1596	1041
14. Fuel Heat Content (Btu/unit, LHV)	140,000		94,000	150,000
15. Sulfur Content wt%	0.3- 0.5		0.15 gr/dscf	1.75
16. Nickel content lb/1000 gal	4.3E-04		NA	8.45E-02
STEAM DESCRIPTION AND SPECIFICATIONS				
17. Steam Heat Content	NA	NA		
18. Steam Temperature (°F)	N/A	N/A		
19. Steam Pressure (psi)	N/A	N/A		
20. Steam Type	N/A	N/A	<input type="checkbox"/> Saturated <input type="checkbox"/> Superheated	<input type="checkbox"/> Saturated <input type="checkbox"/> Superheated
OPERATING LIMITS & SCHEDULE				
21. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.): Res. Fuel Oil= 9,119,160 gal/yr Propane=13,980,960 gal/yr				
22. Operating Schedule (hours/day, months/year, etc.): 24 hr/day, 7 days/wk, 52 wk/yr				

1.0 INTRODUCTION AND OVERVIEW

1.1 Introduction

RDO Processing, LLC. (RDO) processes dehydrated potato products at its plant in Hamer, Idaho. RDO is currently operating under PTC/ Tier II Permit # P-040524 and Consent Order Case No. E-050009, which took effect on June 27, 2005.

1.2 Project Overview

RDO is submitting this PTC permit application to revise the nickel content in fuel oil combusted in Boiler No. 1. On December 15, 2006 a draft permit to construct and Tier II operating permit number T2-060510 was issued for review. RDO would like to modify draft permit condition 3.15.1 which states that the fuel oil shall contain no more than $1.67\text{E-}06$ pounds of nickel by weight per 1000 gallons.

RDO is proposing to increase the nickel content to no more than $8.45\text{E-}02$ lb per 1000 gallons. This value is based on AP-42 Table 1.3-11 emission factors for metals from uncontrolled No. 6 fuel oil combustion.

As a result of the increased nickel content in the fuel oil the nickel emissions from Boiler No. 1 will increase from $1.74\text{E-}06$ lb/hr to $8.80\text{E-}02$ lb/hr. There will be no change to any other emission units and there will be no change to any other TAPs or criteria air pollutants.

2.0 AMBIENT AIR QUALITY IMPACT ANALYSIS

This section describes the estimated ambient air quality impact from the proposed modification. This analysis was completed by rerunning the analysis submitted in the May 4, 2006 Tier II Facility Wide Permit Application with only three parameters changed. The original air quality impact analysis is included in Appendix A. The three parameters changed in the revised analysis were the following:

1. Nickel emission rate from source BOILER 1
2. BOILER 1 stack height
3. BOILER 1 stack diameter

The BOILER 1 nickel emission rate was increased from $1.74\text{E-}06$ lb/hr to $8.80\text{E-}02$ lb/hr. The stack parameters were adjusted to reflect the actual physical conditions. The actual stack height is 101 feet and the stack diameter is 5.25 feet. The previous modeled stack parameters reflected much more conservative modeling conditions with a lower stack height and less plume loft.

To allow for flexibility in meeting IDEQ TAP impact limits for nickel, this analysis supports RDO's request to increase the nickel emission limit for BOILER1 to $8.80\text{E-}02$ lb/hr. The emission rate of $8.80\text{E-}02$ lb/hr nickel was calculated by using the AP-42

emission factor of 8.45E-02 lb/10³ gal for No. 6 fuel oil. This analysis shows that the new AP-42 based nickel emission rate will result in ambient impacts safely within IDEQ impact limits.

2.1 Model Source Data Refinements

The revised emission rate of 8.80E-02 lb/hr nickel from BOILER 1 is shown by this analysis to meet IDEQ impact limits with a 20% buffer. Another model source group (ALLBUTB1) was added to quantify impacts from all other nickel sources other than BOILER1. All other source parameters shown in Table 1 of the original May 4, 2006 and July 7, 2006 submissions, and all other model options, settings, and source data remain unchanged from previous IDEQ-approved modeling.

2.2 Summary of Modeling Results

Table 7-2 from the May 4, 2006 application is revised below to show the nickel impacts resulting from the 8.80E-02 lb/hr emission rate from BOILER1, and its comparison with the IDAPA 58.01.01.585 and 586 ambient impact limits.

Table 2-1: TAP Compared to the AAC or AACC (for those exceeding the EL)

Non-Carcinogens			
Pollutant	Modeled 24-hour µg/m ³	AAC µg/m ³	% AAC
Cobalt	0.00399	2.5	0.16%
Phosphorus	0.00626	5.0	< 0.1%
Vanadium	0.02111	5.0	0.4%
Carcinogens			
Pollutant	Modeled Annual µg/m ³	AACC µg/m ³	% AACC
Arsenic	1.30E-04	2.30E-04	56.2%
Beryllium	<1.0E-05	4.20E-03	<0.2%
Cadmium	4.00E-05	5.60E-04	7.1%
Chromium VI	2.00E-05	8.30E-05	24.1%
Formaldehyde	3.32E-03	7.70E-02	4.3%
Nickel	3.35E-03	4.20E-03	79.8%
Total PAHs	<1.0E-05	1.40E-02	<0.1%

This analysis shows that TAP emissions consistent with the proposed permit limit will not lead to exceedances of IDAPA 58.01.01.585 or 586 impact limits for TAPs, even with the increase in nickel emission rate from BOILER1 to 8.80E-02 lb/hr.

Included in Appendix B are the revised detailed emission estimates for TAP emissions from Boiler No. 1 and the TAPs emission inventory for the facility resulting from the increased nickel emissions from Boiler No. 1.

2.3 Modeling Protocol Documentation

The emails below verify approval of the modeling protocol.

From: <Kevin.Schilling@deq.idaho.gov>
To: <cjenv@hotmail.com>
CC: <DHeiser@jbrenv.com>
Subject: RE: FW: IDEQ Permit Guidance and Forms
Date: Tue, 6 Feb 2007 09:12:14 -0700
MIME-Version: 1.0
Received: from idexfe.deq.idaho.gov ([164.165.173.34]) by bay0-mc11-f9.bay0.hotmail.com with Microsoft SMTPSVC(6.0.3790.2444); Tue, 6 Feb 2007 08:12:22 -0800
Received: from DEQMAIL.deq.idaho.gov ([10.220.7.172]) by idexfe.deq.idaho.gov with Microsoft SMTPSVC(6.0.3790.1830); Tue, 6 Feb 2007 09:12:15 -0700

Chris,

In this instance, from what I understand in your email, the existing protocol agreement can be reused. However, if Dan is submitting essentially a "new" application, please resubmit the appropriate modeling analyses (rather than merely referencing a previous analysis) so that the submittal is a complete package.

Thanks,
Kevin

From: johnson chris [mailto:cjenv@hotmail.com]
Sent: Monday, February 05, 2007 11:29 AM
To: Kevin Schilling
Cc: DHeiser@jbrenv.com
Subject: RE: FW: IDEQ Permit Guidance and Forms

Kevin,

The exchange below established an approved modeling protocol for an analysis I performed for two¹ TAPs that increased at RDO as the result of a change in emissions from a single stack that otherwise resulted in a decrease in emissions of all other pollutants.

Dan provided a submittal based including that analysis to IDEQ at least a week ago. He has been asked to resubmit the application this modeling supported. I believe IDEQ required that after feeling that the submittal he made last week resulted in "scope creep".

The bottom line is that the same modeling analysis will be used to support a new application covering the same proposed action.

¹ In email correspondence inadvertently requested a change in emissions for two TAPs. Modification is only to one TAP- nickel.

To be safe, I hope I can verify that the protocol agreement can be reused when the same analysis is included in a renewed resubmittal in the very near future. Please verify that, or let me know if there would be any difficulties.

Thank you,

...cj

Chris Johnson
JBR Env.

(208) 628-4036

From: <Kevin.Schilling@deq.idaho.gov>
To: <cjenv@hotmail.com>
Subject: FW: IDEQ Permit Guidance and Forms
Date: Thu, 25 Jan 2007 14:27:15 -0700
MIME-Version: 1.0
Received: from idexfe.deq.idaho.gov ([164.165.173.34]) by bay0-mc8-f11.bay0.hotmail.com with Microsoft SMTPSVC(6.0.3790.2444); Thu, 25 Jan 2007 13:27:15 -0800
Received: from DEQMAIL.deq.idaho.gov ([10.220.7.173]) by idexfe.deq.idaho.gov with Microsoft SMTPSVC(6.0.3790.1830); Thu, 25 Jan 2007 14:27:15 -0700

Chris,

I received the ok from legal. Therefore, use of ISCST3 with the PRIME algorithm will be acceptable for this project, provided modeling of criteria pollutants are not necessary.

Please contact me if you have any other questions.

Also, I forwarded your comments on the new process to Mary Anderson. She said they were good comments, but asked if you could officially submit those comments through the comment page on the DEQ website.

Thanks,

Kevin

From: Kevin Schilling
Sent: Thursday, January 25, 2007 10:18 AM
To: 'johnson chris'
Subject: RE: IDEQ Permit Guidance and Forms

Chris,

The quick easy answer is that you have to use AERMOD, no exceptions. What I'm trying to do is find a way around that requirement since this project only involves TAPs and previous modeling was conducted for the facility using ISCST3 and approved by DEQ.

IDAPA 58.01.01.202.02 states requirements for estimates of ambient concentrations: "All estimates of ambient concentrations shall be based on the applicable air quality models, data bases, and other requirements specified in 40 CFR 51, Appendix W (Guideline on Air Quality Models)."

Section 02.a. adds, "Where an air quality model specified in the "Guideline on Air Quality Models", is inappropriate, the model may be modified or another model substituted, subject to written approval of the Administrator of the U.S. Environmental Protection Agency and public comment pursuant to Subsection 209.01.c.; provided that modifications and substitutions of models used for toxic air pollutants will be reviewed by the Department." My contention is that, in this instance, ISCST3 is more appropriate than AERMOD because Since the project only involves TAPs we don't need to get EPA approval; however, the question remains whether we need to go through public comment. I'm waiting to hear back from legal on that.

The intention of the new guidance was not to do away with modeling reports submitted as part of the application. We also realize the forms are not perfect, and we'd appreciate feedback on how should add to them or modify them.

The main thing to do with the application is to make sure all documentation on emissions rates, modeled parameters, operational rates, etc are submitted and adequately verified. When modeling sources, applicants should use typical stack gas flow rates and temperatures, not the highest flow rates and temperatures. If this is too much of a worst-case, unrealistic scenario, then the applicant may model multiple scenarios (25%, 50%, 75%, and 100% load), using emissions and stack parameters associated with each scenario. We see many generators modeled with flow rates exceeding the speed of sound and temperatures above 1000° F. I believe this is because applicants are basing temperatures on those measured at the exhaust manifold.

I will let you know about the use of ISCST3 for this project as soon as I hear back from legal.

Kevin

From: johnson chris [mailto:cjenv@hotmail.com]
Sent: Wednesday, January 24, 2007 4:12 PM
To: Kevin Schilling
Subject: RE: IDEQ Permit Guidance and Forms

Kevin,

The protocol for this project is simple. This methodology was verified as acceptable by IDEQ in the fall of 2006 when the modeling was performed. Because the application was so simple, no written documentation of IDEQ approval was requested. I was not aware at that time that the analysis would not be submitted until now. IDEQ Permit program changes force us to request formal approval again here.

The proposed action involves only one change from modeling previously submitted under an IDEQ approved modeling protocol, consistent with IDEQ recommendations, and accepted by IDEQ in a 2005 permit action.

The one change is for alternative emissions from Boiler4² only. The change will result in a net decrease for all criteria pollutants and most TAPs, but a net increase above IDEQ modeling thresholds for two TAPs. For all pollutants with net decreases, the previously supplied modeling should be conservative. For the two HAPs with increases from

² Reference to Boiler4 is incorrect- Should be Boiler No.1 and there is no change to criteria pollutants only one TAP- nickel.

Boiler4 as a result of the proposed action, that source was remodeled exactly as it was in the IDEQ approved modeling protocol, the only change being the emission rates for the two TAPs. It should still be considered conservative because ISCST3 generally predicts impacts higher than AERMOD for stack sources, and the Prime downwash algorithm was used.

The bigger issue is "How do I document this consistent with the new IDEQ guidelines?" I have a modeling report written in September, but Dan wants to make this application consistent with the new IDEQ guidance. Your earlier comments indicate that my old report would be welcome, and that you do want modeling files despite the lack of requirements for them in the new process guidance. Does IDEQ need anything else to support an application under the new permitting system? New permit guidance indicates IDEQ now wants reports for TAP analyses, but only MI forms for criteria pollutant analyses, so maybe not. I don't understand the reasoning for that distinction, since most modeling analyses, unlike this one, include both criteria pollutant and TAP analyses.

Please help me verify what should be submitted. I've been trying for 3 days to find out what to do for a simple project that shouldn't take long, as soon as I can verify what IDEQ is looking for under the new permit program.

Hope you're not too buried, and that guidance, rules, and protocols under the new system are made clear, which seems like it will be a positive change.

Thank you,

...cj

Chris Johnson

(208) 628-4036



IDAHO DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton
Boise, Idaho 83706-1253

RECEIPT

02/12/07
DATE

RECEIVED FROM

RID Processing LLC
from Melissa Armer

SOURCE						
Cash <input type="checkbox"/> Check <input checked="" type="checkbox"/> Money Order <input type="checkbox"/> No. <u>2254</u>						
DESCRIPTION					AMOUNT OF PAYMENT	
<u>PTC Application</u>					<u>4,000.00</u>	
<u>726 ID 033-00002</u>						
RECEIVED BY <u>ya</u>					TOTAL RECEIVED <u>1000.00</u>	
PID	OBS	CA	SUB-OBJ	WP	BE	

Nº 82693

RECEIVED

FEB 12 2007

DEPARTMENT OF ENVIRONMENTAL QUALITY
STARCAQ PROGRAM

Appendix A
May 4, 2006 Ambient Air Quality Impact Analysis

6.0 AMBIENT AIR QUALITY IMPACT ANALYSIS

This section describes the estimated ambient air quality impact from the proposed modification. Air dispersion modeling has been conducted for this facility in order to demonstrate compliance with National Ambient Air Quality Standards (NAAQS) for criteria pollutants in 40 CFR 51. Toxic air pollutants were also evaluated against threshold emissions levels (ELs), and ambient concentrations for those pollutants exceeding their respective ELs were modeled and compared to the Acceptable Ambient Concentrations (AAC) or Acceptable Ambient Concentrations for Carcinogens (AACC) given in the IDEQ's *Rules for the Control of Air Pollution* (IDAPA 58.01.01) Sections 585 and 586, respectively.

Modeling was generally conducted in accordance with EPA's *Guideline on Air Quality Models* and the Idaho Department of Environmental Quality's (IDEQ) *Air Quality Modeling Guideline*. Meteorological data and ambient air boundaries were discussed with and approved by IDEQ modeling representative Kevin Schilling.

A description of the facility is given in Section 6.1. Details of the model input data, including emission unit information, meteorological data, receptor descriptions, and modeling options are given in Section 6.2. A description of the modeling analysis and results are given in Section 6.3.

6.1 Facility Description

The facility is a potato dehydration plant located approximately seven miles south of Dubois in Clark County, Idaho. The dehydration plant is located in Section 28, Township 9 North, Range 36 East, at Universal Transverse Mercator (UTM) Zone 12 coordinates of 402.4 km east, 4881.8 km north. The terrain surrounding the plant is fairly flat, gently sloping downward from north to south. Elevated terrain is primarily to the north and east of the facility.

Emission units at the facility include the following:

- Two boilers (emission units BOILER_1 and BOILER_2)
- Twelve drum dryers (emission units DRUM1 through DRUM12)
- One National Dryer (dehydrator) with four exhaust fans (emission units NAT_A1, NAT_A2, NAT_B, and NAT_C)
- One fluidized bed dryer (emission unit FBD_DYR)
- A flake packaging area (including emission units FP, FP_BULK, FP_TOR, and FP_BH)
- Three propane heaters in the receiving area (emission units REC_1, REC_2, and REC_3), and
- One cyclone (emission unit 04CYCLON)

The facility is a source of sulfur dioxide (SO₂), nitrogen oxides (NO_x), volatile organic compounds (VOC), carbon monoxide (CO), and particulate matter (PM) from fuel combustion; and a source of SO₂ and PM from the drying process. Total lead emissions from the facility are well below the 0.6 tpy threshold requiring modeling in accordance with Table 1 of IDEQ's modeling guidelines.

A layout of the facility, showing the location of the point sources and buildings is given in Section 2 of this document in Figure 2-1. Figures 6-1 and 6-2 provide more details on the locations of the model sources and buildings for the north and south half of the plant, respectively.

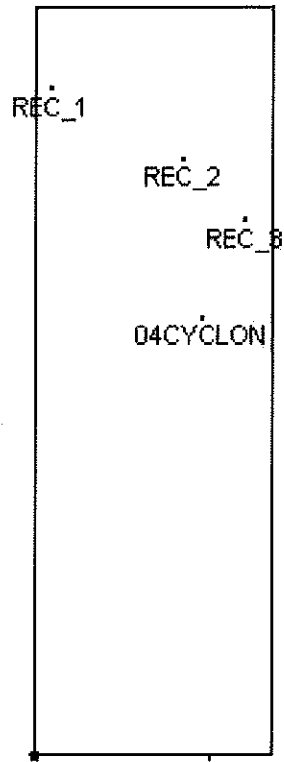


Figure 6-1 Model Source and Building Layout, North Half

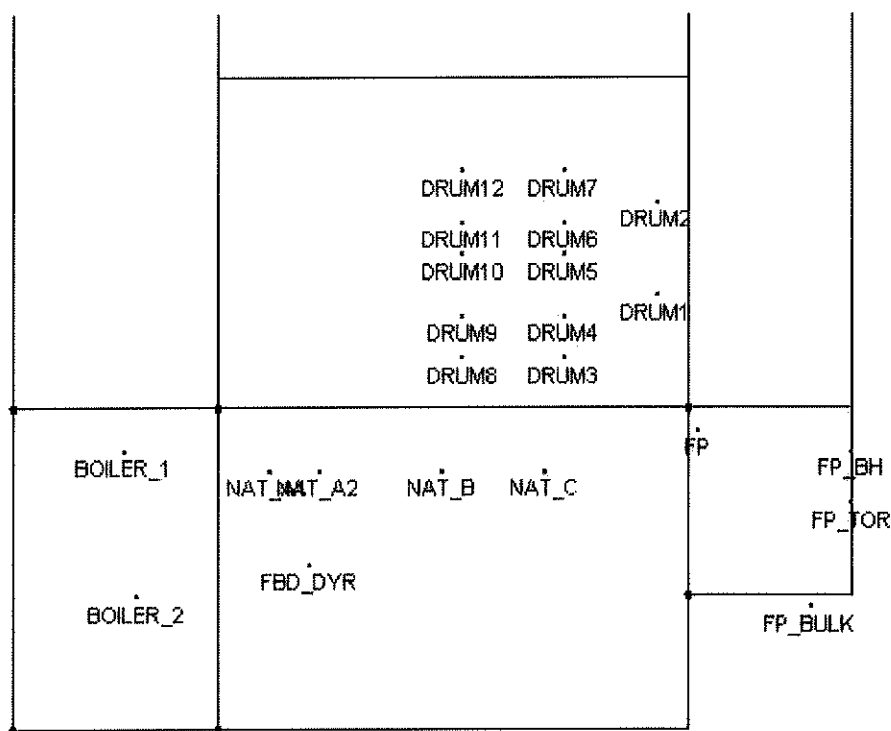


Figure 6-2 Model Source and Building Layout, South Half

Figure 2-2 in Section 2 of this permit application illustrates the ambient air boundary used for air quality modeling purposes in previous permit applications submitted for RDO. For this permit application, RDO has increased the north, east, and south ambient air boundaries approximately 1.5 miles beyond the previous boundaries in each of these directions. This action was approved by IDEQ modeling representative Kevin Schilling. RDO owns a large portion of the property surrounding the facility, and the defined ambient air boundary is well within those limits, and therefore justified.

Consistent with requirements under the national Homeland Security Act, employees are trained to notice and discourage unauthorized access. There are no residences within a mile of the property boundary used in this modeling analysis.

6.2 Model Input

The Industrial Source Complex Short-Term Version 3 Prime (ISCST3) model, version 04269, was used for this analysis. All modeling input and output files are included on the enclosed compact disc.

6.2.1 Model Options

Regulatory default modeling options were used, including stack tip downwash, final plume rise, calms processing, and buoyancy-induced dispersion. Since the area within a 3-km radius of the site is unpopulated agricultural land, rural dispersion coefficients were used. Elevated terrain was considered. Averaging times varied by pollutant and included the 1-hour, 3-hour, 8-hour, 24-hour, and annual averaging times. Modeling options are listed below in Table 6-1.

Table 6-1 Modeling Option Summary

Parameter	Setting
Regulatory Options	Regulatory Default
Dispersion	Rural, by Concentration
Terrain	Simple and Complex
Flagpole Receptors	None
Averaging Times	1-, 3-, 8-, and 24-hour; and/or annual (varies by pollutant)
Dispersion Output	Concentration ($\mu\text{g}/\text{m}^3$)
PRIME Option	Used; though no receptors were in or near the downwash zone

6.2.2 Emission and Source Data

Emission units at the facility and stack parameters are listed in Table 6-2.

Table 6-2 Emission Units and Stack Parameters

Stack No.	Stack ID	Type	Exit Direction	Height above ground (ft)	Temp. (°F)	Velocity (ft/sec)	Diam. (ft)
1	BOILER 1	Boiler	V	34.92	585	20.6102	6.65
2	DRUM1	Drum Dryer 1	V w/cap	45.58	125	0.0033	3.58
3	DRUM2	Drum Dryer 2	V w/cap	45.58	125	0.0033	3.58
4	DRUM3	Drum Dryer 3	V w/cap	45.58	125	0.0033	3.58
5	DRUM4	Drum Dryer 4	V w/cap	45.58	125	0.0033	3.58
6	DRUM5	Drum Dryer 5	V w/cap	45.58	125	0.0033	3.58
7	DRUM6	Drum Dryer 6	V w/cap	45.58	125	0.0033	3.58
8	DRUM7	Drum Dryer 7	V w/cap	45.58	125	0.0033	3.58
9	DRUM8	Drum Dryer 8	V w/cap	45.58	125	0.0033	3.58
10	DRUM9	Drum Dryer 9	V w/cap	45.58	125	0.0033	3.58
11	DRUM10	Drum Dryer 10	V w/cap	45.58	125	0.0033	3.58
12	DRUM11	Drum Dryer 11	V w/cap	45.58	125	0.0033	3.58
13	DRUM12	Drum Dryer 12	V w/cap	45.58	125	0.0033	3.58
14	FBD_DYR	Fluidized Bed Dryer	H	39.42	110	0.0033	0.0033
15	NAT_A1	National Dryer Fan A1	H	36.00	150	0.0033	0.0033
16	NAT_A2	National Dryer Fan A2	H	36.00	176	0.0033	0.0033
17	NAT_B	National Dryer Fan B	H	36.00	167	0.0033	0.0033
18	NAT_C	National Dryer Fan C	H	36.00	148	0.0033	0.0033
19	FP_BULK	Flake Packaging Bulk Line	V	38.75	Ambient	326.4	0.33
20	FP	Flake Packaging	V	39.59	Ambient	18.6	4.00
21	FP_TOR	Flake Packaging Torit	V w/cap	33.92	Ambient	0.0033	0.25
22	FP_BH	Flake Packaging Drum Negative Air Baghouse	V	37.42	Ambient	108.3	1.53
23	REC_1	Propane Heater 1	V w/cap	35.38	90	0.0033	0.40
24	REC_2	Propane Heater 2	V w/cap	34.58	90	0.0033	0.40
25	REC_3	Propane Heater 3	V w/cap	35.58	90	0.0033	0.40
26	BOILER 2	Boiler #2	V	41.42	355	22.2	1.66
27	04CYCLON	Cyclone	Non-vertical	44.08	Ambient	0.0033	0.0033

All emission units emit from stacks and are therefore point sources. No area or volume sources are included in this modeling. In accordance with the IDEQ modeling guidelines, non-vertical stacks were given a default velocity of 0.001 meters per second (m/sec) and a default diameter of 0.001 meters to eliminate stack tip downwash effects. Vertical stacks with rain caps were given a default stack velocity of 0.001 m/sec. The equivalent circular diameter of rectangular stacks was determined using the equation $Area = d^2\pi/4$, where d is the inside diameter of the stack.

6.2.3 Good Engineering Practice Stack Height and Building Downwash

Stacks that are lower than Good Engineering Practice (GEP) height may be influenced by the wake of nearby buildings and structures. Building downwash parameters were determined using

the Building Profile Input Program (BPIP), and these parameters were incorporated into the modeling. Buildings that were included in the downwash calculations are shown in Figure 2-1.

6.2.4 Meteorological Data

IDEQ has specified the use of the Pocatello Municipal Airport surface data for 1987 – 1991 combined with the concurrent Boise/Air Terminal mixing height data for this area. The surface data station number is 24156, the mixing height station number is 24131. This data has been downloaded from EPA's Support Center for Regulatory Air Models (SCRAM) website and processed using PCRAMMET. The anemometer height was assumed to be 10 meters. As recommended by IDEQ Modeling representative Kevin Schilling, the wind directions from Pocatello were altered by rotating them to be consistent with the terrain forcing in this area near the Continental Divide north of Idaho Falls. The final rotation employed was a 40 degree counterclockwise turn. Modeling for all pollutants was performed with one five year meteorological data file.

6.2.5 Receptor Network

The receptor network used for all modeling analyses included 25-meter spacing on and 25 meters beyond the ambient air boundary, 100 meter spacing from 25 meters beyond the boundary out to 200 meters from the boundary, 250 meter grid spacing out to 1500 meters from the boundary, and 500 meter grid spacing to 6000 meters from the boundary. That receptor spacing meets requirements in the IDEQ *Air Quality Modeling Guidelines* since all model predicted maximum impacts occurred on the ambient air boundary within the 25 meter receptor spacing. Figures 6-3 and 6-4 show the model ambient air boundary and inner receptor network, and the outer receptor network, respectively.

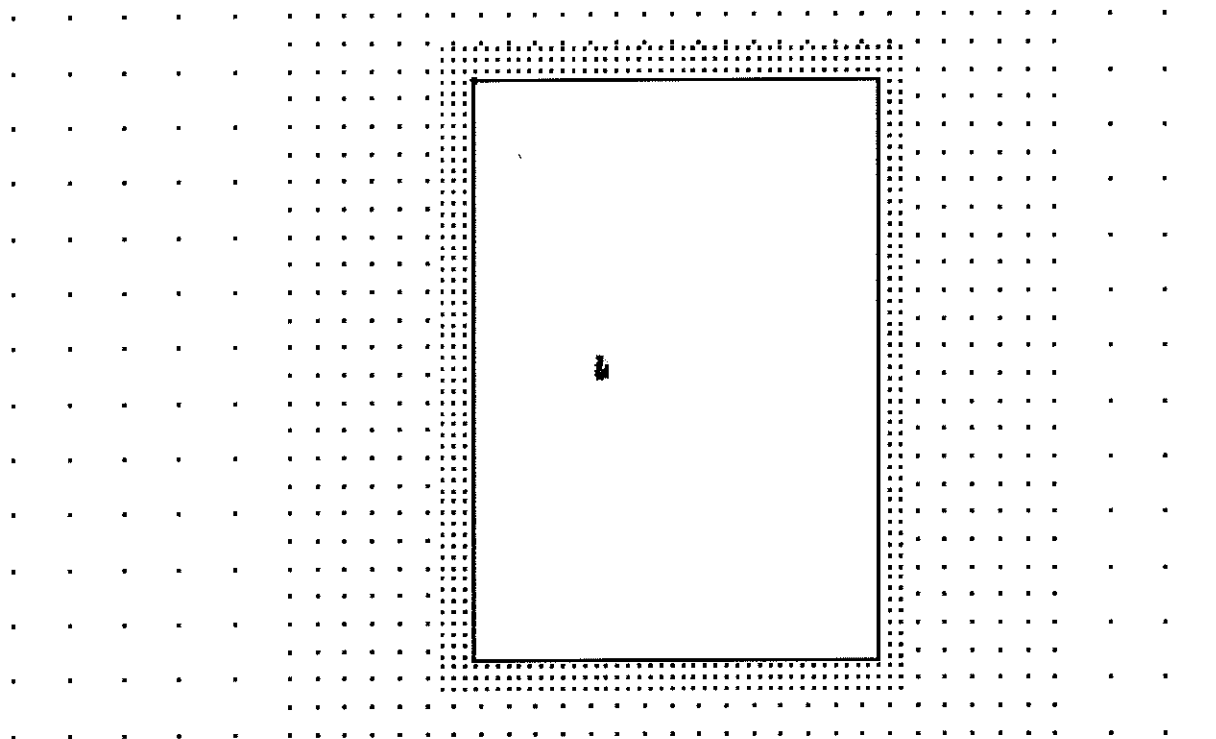


Figure 6-3 Model Ambient Air Boundary and Inner Receptor Network

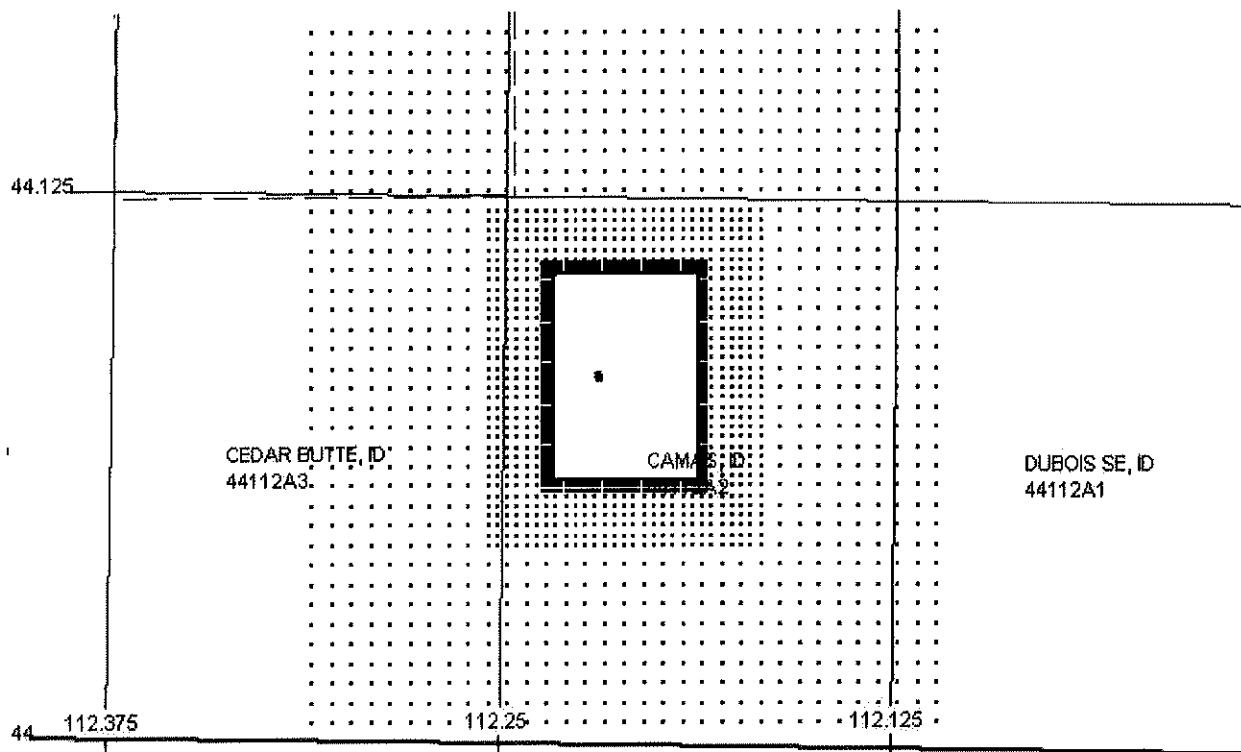


Figure 6-4 Model Outer Receptor Network

Terrain elevations for all receptors were obtained from United States Geological Survey (USGS) digitized elevation model (DEM) 30 meter resolution data.

6.3 Modeling and Results

The objective of the modeling analysis was to determine the maximum ambient concentrations of criteria pollutants for comparison with NAAQS, and the maximum impact of TAPs emitted above IDAPA 58.01.01.585 and 586 emission limits for comparison against their Acceptable Ambient Concentrations (AACs) for 585 TAPs or Acceptable Ambient Concentrations for Carcinogens (AACCs) for 586 TAPs. Ambient air background levels applicable to this area will be added to the air dispersion model output for criteria pollutants to provide comparisons of potential ambient concentrations with facility impacts to the NAAQS. The applicable NAAQS and the associated background concentrations used in this modeling, as prescribed by IDEQ, are shown in Table 6-3. Maximum model impacts reported are more conservative than required innIDEQ modling guidance: second maximum over five years for criteria pollutants and maximum impact over five years for TAPs.

Table 6-3 National Ambient Air Quality Standards and Background Concentrations

Pollutant	Averaging Period	NAAQS ($\mu\text{g}/\text{m}^3$)	Background Concentration ($\mu\text{g}/\text{m}^3$)
PM ₁₀	Annual	50	26
	24-Hour	150	73
NO ₂	Annual	100	17
SO ₂	Annual	80	8
	24-Hour	365	26
	3-Hour	1300	34
CO	8-Hour	10,000	2,300
	1-Hour	40,000	3,600

Table 6-4 summarizes the modeling file names included in the analysis. Details of each run are given in the following sections.

Table 6-4 Model Files

Description	Model File	Meteorological Data Year	Results
SO ₂ modeling	RDO0506_87_SO2	1987 - 1991	All impacts below NAAQS
NO ₂ modeling	RDO0506_87_NO2	1987-1991	All impacts below NAAQS
PM-10 modeling	RDO0506_87_PM10	1987-1991	All impacts below NAAQS
CO refined modeling	RDO0506_87_CO	1987-1991	All impacts below NAAQS
Cobalt modeling	RDO0506_87_Cobalt	1987-1991	All impacts below AACs
Vanadium modeling	RDO0506_87_Vanadium	1987-1991	All impacts below AACs
Arsenic modeling	RDO0506_87_Arsenic	1987-1991	All impacts below AACs
Beryllium modeling	RDO0506_87_Beryllium	1987-1991	All impacts below AACCs
Cadmium modeling	RDO0506_87_Cadmium	1987-1991	All impacts below AACCs
Chromium VI modeling	RDO0506_87_Chromium VI	1987-1991	All impacts below AACCs
Formaldehyde modeling	RDO0506_87_Formald	1987-1991	All impacts below AACCs
Nickel modeling	RDO0506_87_Nickel	1987-1991	All impacts below AACCs
PAH modeling	RDO0506_87_PAHs	1987-1991	All impacts below AACCs

6.3.1 SO₂ Modeling

The facility's SO₂ sources were modeled for the 3-hour, 24-hour, and annual averaging times. The results, the maximum annual average concentration predicted, and the sixth maximum over five years for all shorter averaging periods, are summarized in Table 6-5 below. The appropriate background concentrations have been added to determine compliance with NAAQS.

Table 6-5 SO₂ Modeling Results

	Maximum Modeled Impacts (µg/m³)		
	Annual	3-hour	24-hour
Maximum impact µg/m³	2.09	62.8	15.0
Background µg/m³	8	34	26
Maximum Ambient Concentration µg/m³	10.09	96.8	41.0
NAAQS (µg/m³)	80	1300	365
Max Ambient as % of NAAQS	12.6%	7.5%	11.2%

The maximum impacts occur within the 25-meter grid, on the west boundary NNW of the plant for the short term averaging periods, and on the north boundary north of the plant for the annual average period. All impacts are below NAAQS.

6.3.2 NO₂ Modeling

The facility's NO_x sources were modeled for the annual averaging time. All emitted NO_x is assumed to be converted to NO₂ for this analysis. The results, the maximum annual average concentration predicted, are summarized in Table 6-6 below. The appropriate background concentrations have been added to determine compliance with NAAQS.

Table 6-6 NO₂ Modeling Results

	Maximum Modeled Impacts (µg/m ³)
	Annual
Maximum impact µg/m ³	3.86
Background µg/m ³	17
Maximum Ambient Concentration µg/m ³	20.86
NAAQS (µg/m ³)	100
Max Ambient as % of NAAQS	20.6%

The maximum impacts occur within the 25-meter grid, on the north boundary north of the plant, and all impacts are below NAAQS.

6.3.3 PM-10 Modeling

The facility's PM-10 sources were modeled for the annual and 24-hour averaging times. The results, the maximum annual average concentration predicted, and conservatively the second maximum over five years for the 24-hour averaging period are summarized in Table 6-7 below. The appropriate background concentrations have been added to determine compliance with NAAQS.

Table 6-7 PM-10 Modeling Results

	Maximum Modeled Impacts ($\mu\text{g}/\text{m}^3$)	
	Annual	24-hour
Maximum impact $\mu\text{g}/\text{m}^3$	3.98	56.0
Background $\mu\text{g}/\text{m}^3$	26	73
Maximum Ambient Concentration $\mu\text{g}/\text{m}^3$	29.98	126.0
NAAQS ($\mu\text{g}/\text{m}^3$)	50	150
% NAAQS	60.0%	84.0%

The maximum impacts occur within the 25-meter grid, on the west property boundary NW or N-NW of the plant. All impacts are well below the NAAQS.

6.3.4 CO Modeling

The facility's CO sources were modeled for the 1-hour and 8-hour averaging times. The results, conservatively the second maximum predicted impact over the five years modeled, are summarized in Table 6-8 below. All impacts are below significance levels; no further CO modeling is required.

Table 6-8 CO Modeling Results

	Maximum Modeled Impacts ($\mu\text{g}/\text{m}^3$)	
	1-hour	8-hour
Maximum $\mu\text{g}/\text{m}^3$	67.5	16.4
Significance Level ($\mu\text{g}/\text{m}^3$)	2000	500
% Significance	3.4%	3.3%

6.4 Summary

The modeling results indicate that criteria pollutant emissions from this facility will not cause or contribute to any exceedances of the NAAQS. Table 6-9 summarizes the results of the modeling demonstrating NAAQS compliance.

Table 6-9 Modeling Results Summary

Pollutant	Averaging Time	Location	Maximum $\mu\text{g}/\text{m}^3$	Backgrd $\mu\text{g}/\text{m}^3$	Total $\mu\text{g}/\text{m}^3$	NAAQS $\mu\text{g}/\text{m}^3$	% NAAQS
SO ₂	Annual	N bndy Nof plant	2.09	8	10.09	80	12.6%
	3-hour	W bndy NNW of plant	62.8	34	96.8	1300	7.5%
	24-hour	W bndy NNW of plant	15.0	26	41.0	365	11.2%
NO ₂	Annual	N bndy Nof plant	3.86	17	20.86	100	20.9%
PM-10	Annual	N bndy Nof plant	3.98	26	29.98	50	60.0%
	24-hour	W bndy NNW of plant	56.0	73	126.0	150	84.0%
CO	1-hour	W bndy NNW of plant	67.5	N/A (insignificant)			
	8-hour	W bndy NNW of plant	16.4	N/A (insignificant)			

7.0 DEMONSTRATION OF PRE-CONSTRUCTION COMPLIANCE WITH TOXIC STANDARDS

Table 7-1 summarizes the TAP emissions and the respective EL thresholds from IDAPA 58.01.01 585 and 586. Non-carcinogens which exceed the EL include cobalt and vanadium. Carcinogens exceeding the EL are arsenic, beryllium, cadmium, chromium VI, formaldehyde, nickel, and total PAHs.

Table 7-1 TAPs Compared to the EL

NON-CARCINOGENS				
Pollutant	Max. Hourly Emissions	Screening Level	Modeling?	Emissions
	(lb/hr)	(lb/hr)	(Y/N)	(tons/yr)
Antimony	3.37E-03	3.3E-02	N	1.47E-02
Barium	1.78E-03	3.3E-02	N	7.65E-03
Chromium	5.83E-04	3.3E-02	N	2.51E-03
Cobalt	3.86E-03	3.3E-03	Y	1.69E-02
Copper	1.15E-03	6.7E-02	N	5.03E-03
Ethylbenzene	4.08E-05	2.9E+01	N	1.79E-04
Fluoride	2.39E-02	1.67E-01	N	1.05E-01
Hexane	5.31E-02	1.2E+01	N	2.33E-01
Manganese	1.94E-03	3.33E-01	N	8.47E-03
Mercury	2.96E-04	3.E-03	N	1.29E-03
Molybdenum	5.37E-04	6.67E-01	N	2.32E-03
Naphthalene	7.43E-04	3.33E+00	N	3.23E-03
Pentane	7.67E-02	1.18E+02	N	3.36E-01
Phosphorous	6.07E-03	7.E-03	N	2.66E-02
Selenium	1.44E-03	1.3E-02	N	6.31E-03
1,1,1-Trichloroethane	1.75E-04	1.3E+02	N	6.63E-04
Toluene	4.05E-03	2.5E+01	N	1.78E-02
o-Xylene	8.60E-05	2.9E+01	N	3.06E-04
Vanadium	2.07E-02	3.0E-03	Y	8.96E-02
Zinc	1.93E-02	6.67E-01	N	8.46E-02

CARCINOGENS				
Pollutant	Max. Hourly Emissions	Screening Level	Modeling?	Emissions
	(lb/hr)	(lb/hr)	(Y/N)	(tons/yr)
Arsenic	8.53E-04	1.5E-06	Y	3.73E-03
Benzene	1.99E-04	8.0E-04	N	8.08E-04
Beryllium	2.88E-04	2.8E-05	Y	1.26E-03
Cadmium	3.20E-04	3.7E-06	Y	1.37E-03
Chromium VI	1.59E-04	5.6E-07	Y	6.97E-04
Formaldehyde	2.34E-02	5.1E-04	Y	1.00E-01
Nickel	6.30E-05	2.7E-05	Y	2.71E-04
Benzo(a)pyrene	3.54E-08	2.0E-06	N	1.55E-07
Benz(a)anthracene	2.63E-06	NA	NA	1.14E-05
Benzo(b,k)fluoranthene	1.00E-06	NA	NA	4.34E-06
Chrysene	1.58E-06	NA	NA	6.86E-06
Dibenzo(a,h)anthracene	1.12E-06	NA	NA	4.87E-06
Indeno(1,2,3-cd)pyrene	1.41E-06	NA	NA	6.13E-06
Total PAHs	7.54E-06	2.0E-06	Y	3.30E-05

Consistent with IDAPA 585 and 586 regulations, modeling was conducted for the 24-hour averaging time for the AAC evaluation and the annual averaging time for the AACC evaluation for all TAPs identified as emitted above the IDAPA Emission limits (ELs). The TAPs modeled included the IDAPA 585 non-carcinogens cobalt and vanadium, and the IDAPA 586 carcinogens arsenic, beryllium, cadmium, chromium VI, formaldehyde, nickel, and PAHs. The same model layout, parameters, options, meteorological data, and receptor network described for the criteria pollutant modeling were used for the TAP modeling.

Table 7-2 shows the modeled ambient concentrations which are compared to the AAC or AACC; compliance is demonstrated for all TAPs. All maximum predicted annual average impacts occurred on the north boundary north of the plant, and all maximum predicted 24-hour average impacts occurred on the west boundary NW or N-NW of the plant.

Table 7-2 TAPs Compared to the AAC or AACC (for those exceeding the EL)

Non-Carcinogens			
Pollutant	Modeled 24-hour µg/m3	AAC µg/m3	% AAC
Cobalt	0.00344	2.5	<0.1%
Vanadium	0.0183	5.0	0.4%
Carcinogens			
Pollutant	Modeled Annual µg/m3	AACC µg/m3	% AACC
Arsenic	1.00E-04	2.30E-04	43.5%
Beryllium	<1.0E-05	4.20E-03	<0.2%
Cadmium	3.00E-05	5.60E-04	5.4%
Chromium VI	2.00E-05	8.30E-05	24.1%
Formaldehyde	2.65E-03	7.70E-02	3.4%
Nickel	1.00E-05	4.20E-03	0.2%
Total PAHs	<1.0E-05	1.40E-02	<0.1%

Appendix B
Toxic Air Pollutants Detailed Emission Calculations

TOXIC AIR POLLUTANT CALCULATIONS

TABLE 1. BOILER #1 - NON-CARCINOGENS
FUEL OIL

Pollutant	Emission Factor (lb/1,000 gal)	Emissions (lb/hr)	Emissions (tons/yr)	Emissions (grams/sec)
Antimony	5.25E-03	5.47E-03	2.39E-02	6.89E-04
Barium	2.57E-03	2.68E-03	1.17E-02	3.37E-04
Chromium	8.45E-04	8.80E-04	3.85E-03	1.11E-04
Cobalt	6.02E-03	6.27E-03	2.74E-02	7.90E-04
Copper	1.76E-03	1.83E-03	8.02E-03	2.31E-04
Ethylbenzene	6.36E-05	6.62E-05	2.90E-04	8.34E-06
Fluoride	3.73E-02	3.88E-02	1.70E-01	4.89E-03
Hexane	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	3.00E-03	3.12E-03	1.37E-02	3.93E-04
Mercury	1.13E-04	1.18E-04	5.15E-04	1.48E-05
Molybdenum	7.87E-04	8.19E-04	3.59E-03	1.03E-04
Naphthalene	1.13E-03	1.18E-03	5.15E-03	1.48E-04
Pentane	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phosphorous	9.46E-03	9.85E-03	4.31E-02	1.24E-03
Selenium	6.83E-04	7.11E-04	3.11E-03	8.96E-05
1,1,1-Trichloroethane	2.36E-04	2.46E-04	1.08E-03	3.10E-05
Toluene	6.20E-03	6.45E-03	2.83E-02	8.13E-04
o-Xylene	1.09E-04	1.13E-04	4.97E-04	1.43E-05
Vanadium	3.18E-02	3.31E-02	1.45E-01	4.17E-03
Zinc	2.91E-02	3.03E-02	1.33E-01	3.82E-03

TABLE 2. BOILER #1 - CARCINOGENS
FUEL OIL

Pollutant	Emission Factor (lb/1,000 gal)	Emissions (lb/hr)	Emissions (tons/yr)	Emissions (grams/sec)
Arsenic	1.32E-03	1.37E-03	6.02E-03	1.73E-04
Benzene	2.14E-04	2.23E-04	9.76E-04	2.81E-05
Beryllium	2.78E-05	2.89E-05	1E-04	4.E-06
Cadmium	3.98E-04	4.14E-04	1.81E-03	5.E-05
Chromium VI	2.48E-04	2.58E-04	1.13E-03	3.25E-05
Formaldehyde	3.30E-02	3.44E-02	2E-01	4.33E-03
Nickel	8.45E-02	8.80E-02	3.85E-01	1.11E-02
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benz(a)anthracene	4.01E-06	4.17E-06	2E-05	5.26E-07
Benzo(b,k)fluoranthene	1.48E-06	1.54E-06	6.75E-06	1.94E-07
Chrysene	2.38E-06	2.48E-06	1.09E-05	3.12E-07
Dibenzo(a,h)anthracene	1.67E-06	1.74E-06	8E-06	2.19E-07
Indeno(1,2,3-cd)pyrene	2.14E-06	2.23E-06	9.76E-06	2.81E-07
Total PAHs	1.17E-05	1.22E-05	5.33E-05	1.53E-06

Notes: * Emission factor units in pounds per 1,000,000 MMBTU.

Emission estimates represent maximum emissions based on burning #4, #5, or #6 fuel oil, and based on AP-42 Tables 1.3-9, 1.3-10, and 1.3-11 (except nickel).

Nickel estimates based on AP-42 Table 1.3-11 emission factor for residual fuel oil.

Emissions based on boiler operating with maximum fuel usage of 1041 gal/hour.

Emissions based on 8,760 hours/year of operation.

TOXIC AIR POLLUTANT EMISSION INVENTORY

TABLE 1. NON-CARCINOGENS

Pollutant	Max. Hourly Emissions (lb/hr)	Screening	Modeling? (Y/N)	Emissions (tons/yr)
		Level (lb/hr)		
Antimony	5.47E-03	3.3E-02	N	2.39E-02
Barium	2.80E-03	3.3E-02	N	1.22E-02
Chromium	9.20E-04	3.3E-02	N	3.99E-03
Cobalt	6.27E-03	3.3E-03	Y	2.75E-02
Copper	1.86E-03	6.7E-02	N	8.11E-03
Ethylbenzene	6.62E-05	2.9E+01	N	2.90E-04
Fluoride	3.88E-02	1.67E-01	N	1.70E-01
Hexane	5.20E-02	1.2E+01	N	2.28E-01
Manganese	3.13E-03	3.33E-01	N	1.37E-02
Mercury	1.25E-04	3.E-03	N	5.41E-04
Molybdenum	8.51E-04	6.67E-01	N	3.70E-03
Naphthalene	1.19E-03	3.33E+00	N	5.21E-03
Pentane	7.51E-02	1.18E+02	N	3.29E-01
Phosphorous	9.85E-03	7.E-03	Y	4.31E-02
Selenium	7.12E-04	1.3E-02	N	3.12E-03
1,1,1-Trichloroethane	2.67E-04	1.3E+02	N	1.08E-03
Toluene	6.53E-03	2.5E+01	N	2.86E-02
o-Xylene	1.28E-04	2.9E+01	N	4.97E-04
Vanadium	3.33E-02	3.0E-03	Y	1.45E-01
Zinc	3.09E-02	6.67E-01	N	1.36E-01

TABLE 2. CARCINOGENS

Pollutant	Max. Hourly Emissions (lb/hr)	Screening	Modeling? (Y/N)	Emissions (tons/yr)
		Level (lb/hr)		
Arsenic	1.38E-03	1.5E-06	Y	6.04E-03
Benzene	2.83E-04	8.0E-04	N	1.18E-03
Beryllium	2.93E-05	2.8E-05	Y	1.28E-04
Cadmium	4.46E-04	3.7E-06	Y	1.92E-03
Chromium VI	2.58E-04	5.6E-07	Y	1.13E-03
Formaldehyde	3.65E-02	5.1E-04	Y	1.58E-01
Nickel	8.80E-02	2.7E-05	Y	3.86E-01
Benzo(a)pyrene	3.47E-08	2.0E-06	N	1.52E-07
Benz(a)anthracene	4.23E-06	NA	NA	1.85E-05
Benzo(b,k)fluoranthene	1.59E-06	NA	NA	6.93E-06
Chrysene	2.53E-06	NA	NA	1.10E-05
Dibenzo(a,h)anthracene	1.79E-06	NA	NA	7.79E-06
Indeno(1,2,3-cd)pyrene	2.26E-06	NA	NA	9.88E-06
Total PAHs	1.22E-05	2.0E-06	Y	5.34E-05